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Summary report on the technical analysis of the first biennial update report of Bosnia and Herzegovina submitted on 12 March 2015

In accordance with decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention (non-Annex I Parties), consistent with their capabilities and the level of support provided for reporting, should submit their first biennial update report (BUR) by December 2014. The least developed country Parties and small island developing States may submit BURs at their discretion.

Further, in accordance with paragraph 58(a) of the same decision, the first round of international consultation and analysis (ICA) will be conducted for non-Annex I Parties commencing within six months of the submission of their first BURs. The process of ICA includes two steps: the technical analysis of the submitted BURs, followed by a workshop on the facilitative sharing of views under the Subsidiary Body for Implementation.

This summary report presents the results of the technical analysis of the first BUR of Bosnia and Herzegovina undertaken by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.

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I. Introduction and process overview

A. Introduction

1. In accordance with decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention (non-Annex I Parties), consistent with their capabilities and the level of support provided for reporting, should submit their first biennial update report (BUR) by December 2014. The least developed country Parties and small island developing States may submit BURs at their discretion. Further, in accordance with paragraph 58(a) of the same decision, the first round of international consultation and analysis (ICA) will be conducted for non-Annex I Parties commencing within six months of the submission of their first BURs. The process of ICA includes two steps: the technical analysis of the submitted BURs, resulting in a summary report for each BUR analysed, followed by a workshop on the facilitative sharing of views under the Subsidiary Body for Implementation.

2. This summary report presents the results of the technical analysis of the first BUR of Bosnia and Herzegovina undertaken by a team of technical experts (TTE) in accordance with the provisions on the composition, modalities and procedures of the TTE under ICA contained in the annex to decision 20/CP.19.

B. Process overview

3. Bosnia and Herzegovina submitted its first BUR on 12 March 2015. During the consultation with the TTE, the delayed submission of the BUR was attributed to a six month internal approval process required by the relevant authorities. However, the technical team indicated that the BUR was completed before December 2014, consistent with the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention" (hereinafter referred to as the UNFCCC reporting guidelines on BURs).

4. The technical analysis of the BUR took place from 17 to 21 August 2015 in Bonn, Germany, and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Mr. Kamal Djemouai (Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) member from Algeria), Mr. Amit Garg (India), Mr. Nicolas Leclercq (CGE member from Canada), Ms. Helen Joan Plume (New Zealand) and Mr. Marius Taranu (Republic of Moldova). Mr. Djemouai and Ms. Plume were the co-leads. Ms. Alma Jean and Ms. Karen Ortega (secretariat) provided administrative support to the TTE.

5. During the technical analysis, in addition to the written exchange through the secretariat, to provide technical clarifications on the information reported in the BUR, the TTE and Bosnia and Herzegovina also engaged in discussion via Skype conferencing, primarily to reach a common understanding on the identification and prioritization of the capacity-building needs. Following the technical analysis of the BUR, the TTE prepared and shared a draft summary report with Bosnia and Herzegovina on 26 October 2015 for its review and comment. Bosnia and Herzegovina, in turn, provided its feedback on the draft summary report on 31 December 2015.

6. The TTE responded to and incorporated the comments referred to in paragraph 5 above from Bosnia and Herzegovina and finalized, in consultation with Bosnia and Herzegovina, the summary report on 31 December 2015.

II. Technical analysis of information reported in the biennial update report

A. Scope of the technical analysis

7. The scope of the technical analysis is outlined in decision 20/CP.19, annex, paragraph 15, according to which the technical analysis aims to, without engaging in a discussion on the appropriateness of these actions, increase transparency of mitigation actions and their effects, and shall entail the following:

(a) Identification of the extent to which the elements of information listed in the ICA guidelines contained in decision 2/CP.17, annex IV, paragraph 3(a), are included in the BUR of the Party concerned (see chapter II.B);

(b) A technical analysis of the information contained in the BUR, specified in the UNFCCC reporting guidelines on BURs contained in decision 2/CP.17, annex III, and any additional technical information provided by the Party concerned (see chapter II.C);

(c) Identification of, in consultation with the Party concerned, capacity-building needs related to the facilitation of reporting in accordance with annex III to decision 2/CP.17 and to the participation in ICA in accordance with annex IV to decision 2/CP.17, taking into account Article 4, paragraph 3, of the Convention (see chapter II.D).

8. The remainder of this chapter presents the results of each of the three parts of the technical analysis of Bosnia and Herzegovina's BUR outlined in paragraph 7 above.

B. Overview of the elements of information reported

9. The elements of information referred to in paragraph 7(a) above include: the national greenhouse gas (GHG) inventory report; mitigation actions, including a description of such actions, an analysis of their impacts and the associated methodologies and assumptions, and the progress made in their implementation; information on domestic measurement, reporting and verification (MRV); and support received.

10. Further, in accordance with decision 20/CP.19, annex, paragraph 15(a), in undertaking the technical analysis of the submitted BUR, the TTE shall identify the extent to which the elements of information listed in the guidelines contained in decision 2/CP.17, annex IV, paragraph 3(a), are included in the BUR of the Party concerned. The results of this analysis are presented in tables 1, 2 and 3 below.

1. National greenhouse gas inventory

11. The parts of the UNFCCC reporting guidelines on BURs on reporting information on GHG emissions by sources and removals by sinks in BURs are contained in decision 2/CP.17, paragraph 41(g), and annex III, paragraphs 3–10, of the same decision. Further, as per decision 2/CP.17, annex III, paragraph 3, non-Annex I Parties should submit updates of national GHG inventories according to paragraphs 8–24 of the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention" as contained in the annex to decision 17/CP.8. The scope of the updates on national GHG inventories should be consistent with capacities, time constraints, data availabilities and the level of support provided by developed country Parties for biennial update reporting.

12. Table 1 below presents results of the identification of the extent to which the elements of information on GHGs are included in the first BUR of Bosnia and Herzegovina in accordance with the relevant parts of the UNFCCC reporting guidelines on BURs.

Table 1

Identification of the extent to which the elements of information on greenhouse gases are included in the first biennial update report of Bosnia and Herzegovina

Decision	*Reporting requirements*	*Yes, Partly, No*	*Comments on the extent of the information provided*
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available	Yes	
Decision 2/CP.17, annex III, paragraph 5	The updates of the sections on the national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines for National GHG Inventories, the IPCC good practice guidance and Uncertainty Management in National GHG Inventories, and the IPCC good practice guidance for LULUCF; any change to the emission factor may be made in the subsequent full national communication	Partly	The second national communication has time series information for 1990–2001; the BUR has data for 2010 and 2011, but no updated data for the previous time series
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of a national inventory report as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:		
	• Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors)	Partly	Tables for 2010 and 2011 are included, but the memo items (international bunkers and CO_2 emissions from biomass) are missing
	• Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6)	No	
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	• Tables included in annex 3A.2 to chapter 3 of the IPCC good practice guidance for LULUCF	No	
	• The sectoral report tables annexed to the Revised 1996 IPCC Guidelines	No	
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in the previous national communications	No	The second national communication has time series information for 1990–2001; the BUR has data for 2010 and 2011; no data are reported for the intervening years
Decision 2/CP.17,	Non-Annex I Parties that have previously reported	Partly	The information provided is

Decision	*Reporting requirements*	*Yes Partly No*	*Comments on the extent of the information provided*
annex III, paragraph 8	on their national GHG inventories contained in their national communications are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000)		for total emissions (in Gg CO_2 eq) and for emissions of each gas (CO_2, CH_4 and N_2O); emissions in 2010 and 2011 are compared to emissions in 1990, but no summary information tables of inventories for previous submission years are provided
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex	No	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved	Yes	
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of the following gases by sources and removals by sinks:		
	• CO_2	Yes	
	• CH_4	Yes	
	• N_2O	Yes	
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of HFCs, PFCs and SF_6	Partly	The information provided in the BUR states that there are anecdotal sources of HFCs, PFCs and SF_6, but no data are provided
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	• International aviation	No	
	• Marine bunker fuels	No	
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs such as:		
	• CO	Yes	
	• NOx	Yes	
	• NMVOCs	Yes	
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as SO_x, included in the Revised 1996 IPCC Guidelines, may be included at the discretion of the Parties	Yes	
Decision 17/CP.8,	Non-Annex I Parties are encouraged to provide		

Decision	*Reporting requirements*	*Yes Partly No*	*Comments on the extent of the information provided*
annex, paragraph 21	information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of emission factors and activity data. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, emission factors and activity data used in their estimation of emissions, as appropriate. Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building:		
	• Information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol	Yes	
	• Explanation of the sources of emission factors	Yes	
	• Explanation of the sources of activity data	Partly	Wherever possible, data were collected not only from the Agency for Statistics of Bosnia and Herzegovina and entity institutes of statistics, but also from the producers of emissions themselves; however, there is no information provided on data sources
	• If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	NA	
	◦ Source and/or sink categories		
	◦ Methodologies		
	◦ Emission factors		
	◦ Activity data		
	• Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building	Yes	
Decision 17/CP.8, annex, paragraph 24	Non-Annex I Parties are encouraged to provide information on the level of uncertainty associated with inventory data and their underlying assumptions, and to describe the methodologies used, if any, for estimating these uncertainties:		
	• Level of uncertainty associated with inventory data	Partly	The BUR provides an estimated uncertainty in the calculation of CO_2 emissions for 2010 and 2011 (CO_2 from

Decision	*Reporting requirements*	*Yes Partly No*	*Comments on the extent of the information provided*
			fuel combustion), noting that CO_2 emissions from the energy sector account for more than 90 per cent of total CO_2 emissions; the level of uncertainty for the rest of the inventory is not included
	• Underlying assumptions	Yes	Assumptions for energy sector data are well described
	• Methodologies used, if any, for estimating these uncertainties	Partly	There are some suggestions that IPCC methodologies are used, but expert judgement also appears to be included

Abbreviations: BUR = biennial update report, Gg CO_2 eq = gigagrams of carbon dioxide equivalent, GHG = greenhouse gas, IPCC = Intergovernmental Panel on Climate Change, IPCC good practice guidance = *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPCC good practice guidance for LULUCF = *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, NA = not applicable, NMVOC = non-methane volatile organic compound, Revised 1996 IPCC Guidelines = *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*.

2. Mitigation actions and their effects

13. The parts of the UNFCCC reporting guidelines on BURs on reporting information on mitigation actions in the BUR are contained in decision 2/CP.17, annex III, paragraphs 11–13.

14. Bosnia and Herzegovina did report mitigation actions in its first BUR. The mitigation actions reported are provided in tabular and textual format.

15. Table 2 below presents results of the identification of the extent to which the elements of information on mitigation actions are included in the first BUR of Bosnia and Herzegovina in accordance with the relevant parts of the UNFCCC reporting guidelines on BURs.

Table 2
Identification of the extent to which the elements of information on mitigation actions are included in the first biennial update report of Bosnia and Herzegovina

Decision	*Reporting requirements*	*Yes Partly No*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or groups of mitigation actions including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information to the extent possible:		
(a)	Name and description of the mitigation action, including Information on the nature of the action and coverage (i.e. sectors and gases), quantitative goals and progress indicators	Partly	Bosnia and Herzegovina has not completely provided quantitative goals for four mitigation actions in table 3.11

Decision	*Reporting requirements*	*Yes Partly No*	*Comments on the extent of the information provided*
(b)	Information on methodologies and assumptions:		
	• Methodologies	Partly	Bosnia and Herzegovina used sectoral methodologies for estimating some emission reductions and identified three future mitigation scenarios
	• Assumptions	Yes	
(c)	Objectives of the action and steps taken or envisaged to achieve that action:		
	• Objectives of the action	Yes	
	• Steps taken or envisaged to achieve that action	Partly	Bosnia and Herzegovina provides some information on steps taken or envisaged
(d)	Information on the progress of implementation of the mitigation actions and the underlying steps taken or envisaged, and the results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible:		
	• Progress of implementation of the mitigation actions	Partly	General information is provided on the progress of implementation of mitigation actions
	• Underlying steps taken or envisaged	Partly	Bosnia and Herzegovina partly presents the steps being undertaken towards progress
	• Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible	Partly	Bosnia and Herzegovina partly provides information on results achieved and estimated emission reductions
(e)	Information on international market mechanisms	No	Bosnia and Herzegovina does not provide information on its involvement in the international market mechanism, although it has registered clean development mechanism projects
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on the description of domestic measurement, reporting and verification arrangements	Yes	Bosnia and Herzegovina has proposed a mechanism of domestic measurement, reporting and verification for nationally appropriate mitigation action projects

3. Finance, technology and capacity-building needs and support received

16. The parts of the UNFCCC reporting guidelines on BURs on reporting information on finance, technology and capacity-building needs and support received in the BUR are contained in decision 2/CP.17, annex III, paragraphs 14–16.

17. Table 3 below presents results of the identification of the extent to which the elements of information on finance, technology and capacity-building needs and support received are included in the BUR of Bosnia and Herzegovina in accordance with the relevant parts of the UNFCCC reporting guidelines on BURs.

Table 3
Identification of the extent to which the elements of information on finance, technology and capacity-building needs and support received are included in the first biennial update report of Bosnia and Herzegovina

Decision	*Reporting requirements*	*Yes Partly No*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on constraints and gaps, and related financial, technical and capacity-building needs:		
	• Constraints and gaps	Yes	
	• Related financial, technical and capacity-building needs	Yes	
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should also provide updated information on financial resources, technology transfer, capacity-building and technical support received from the GEF, Annex II Parties and other developed country Parties, the GCF and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR	Partly	Bosnia and Herzegovina only provides limited information on support received for the preparation of its BUR
Decision 2/CP.17, annex III, paragraph 16	With regard to the development and transfer of technology, non-Annex I Parties should provide information on technology needs, which must be nationally determined, and technology support received:		
	• Technology needs, which must be nationally determined	No	
	• Technology support received	Yes	

Abbreviations: BUR = biennial update report, GCF = Green Climate Fund, GEF = Global Environment Facility.

C. Technical analysis of the information reported

18. The technical analysis referred to in paragraph 7(b) above aims to, without engaging in discussion on the appropriateness of these actions, increase transparency of mitigation actions and their effects. Accordingly, the technical analysis focused on the transparency of information reported in BURs.

19. In addition to covering the information in the BUR and any additional technical information provided by the Party concerned, the technical analysis also focused in relation to information reported on national GHG inventories, on the consistency of the methods used for developing those inventories with the appropriate methods developed by the Intergovernmental Panel on Climate Change (IPCC) and referred to in the UNFCCC reporting guidelines on BURs. The results of the technical analysis are presented in the remainder of the chapter.

1. Information on national circumstances and institutional arrangements relevant to the preparation of national communications on a continuous basis

20. As per the scope defined in decision 2/CP.17, annex III, paragraph 2, the BURs should provide an update to information contained in the most recently submitted national communication, including, among other things, information on national circumstances and institutional arrangements relevant to the preparation of national communications on a continuous basis. For national communications, non-Annex I Parties report national circumstances following reporting guidance contained in decision 17/CP.8, annex, paragraphs 3–5.

21. In accordance with decision 17/CP.8, annex, paragraph 3, Bosnia and Herzegovina, in its BUR, reported information on national circumstances, such as its geography, population, climate, and political and economic profiles. Bosnia and Herzegovina is a sovereign state with a decentralized political and administrative structure comprising two entities: the Federation of Bosnia and Herzegovina and the Republic of Srpska, in addition to the district of Brčko. The TTE also noted that armed conflicts have had an important impact on Bosnia and Herzegovina's economic development, infrastructure and population growth (which has decreased between 1991 and 2013).

22. In its BUR, Bosnia and Herzegovina noted that it has made a series of efforts to establish appropriate political, institutional and legal frameworks to meet the commitments stemming from the Convention. The TTE noted that Bosnia and Herzegovina has reported transparently on institutional arrangements relevant to the preparation of the national communications and BURs on a continuous basis. Bosnia and Herzegovina noted that the institution responsible for the preparation of this report is the UNFCCC Focal Point of Bosnia and Herzegovina, the Ministry of Spatial Planning, Civil Engineering and Ecology, Republic of Srpska. The TTE also noted the creation of the Project Board for the preparation of the first BUR in order to coordinate the overall project and provide strategic guidance to the team of experts working on the development of the BUR.

23. While the TTE noted the efforts of Bosnia and Herzegovina to build capacities of domestic institutions in order to enable them to take a more active role in the preparation of future reports, it also noted the need to further enhance the institutional arrangements for that purpose.

2. National greenhouse gas emissions by sources and removals by sinks

24. Bosnia and Herzegovina reported, in its BUR, information on national GHG inventories covering GHG emissions and removals for the years 2010 and 2011 following the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* and *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). During the technical analysis, the TTE was informed by Bosnia and Herzegovina that all emission factors used in the BUR are default emission factors, according to the Revised 1996 IPCC Guidelines.

25. With regard to activity data, the BUR states that wherever possible, data were collected not only from the Agency for Statistics of Bosnia and Herzegovina and entity institutes of statistics, but also from the producers of emissions themselves. However, the BUR also states that there are no environmental databases or monitoring systems in place that would form a basis for the preparation of the GHG inventory. Further, during the technical analysis, the TTE was provided with more details on this aspect and learned that Bosnia and Herzegovina does not have a clearly defined system for data collection and processing, quality assurance and control of input data, or a reporting and monitoring

system, due to a lack of proper legal regulations that would fully define competences and responsibilities in this area. Most of the data are collected according to official statistical publications, questionnaires, sectoral development strategies (e.g. for energy and agriculture), approved projects and published papers and by using expert judgement. Despite this lack of clearly defined institutional arrangements for the GHG inventory, Bosnia and Herzegovina reported its GHG inventory while acknowledging the need to improve transparency and completeness.

26. In its BUR, Bosnia and Herzegovina reports GHG emissions and removals by sector and by gas covering the energy, industrial processes, agriculture, land use, land-use change and forestry (LULUCF) and waste sectors. Emissions from the solvent and other product use sector are reported as "NE" (not estimated). Carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) are reported; in addition, emissions of the precursor gases of nitrogen oxides, carbon monoxide and non-methane volatile organic compounds are reported, together with sulphur oxides. Totals by gas are provided at the sector and national levels. For both 2010 and 2011, total emissions on a carbon dioxide equivalent (CO_2 eq) basis at the sector level and at a national level are also presented. At the national aggregate level, the total emissions are presented both including and excluding LULUCF. In 2010, total emissions were 28,008.83 Gg CO_2 eq excluding LULUCF and 21,532.80 Gg CO_2 eq including LULUCF. In 2011, total emissions were 31,095.3 Gg CO_2 eq excluding LULUCF and 24,921.30 Gg CO_2 eq including LULUCF. In 1990, total emissions were 34,043 Gg CO_2 eq excluding LULUCF.

27. While Bosnia and Herzegovina reports in the BUR that anecdotal sources of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) have been identified, there are no emission data reported. The BUR notes that there is no domestic aviation in Bosnia and Herzegovina, and that all aviation emissions are therefore due to international aviation. The summary tables (tables 8 and 9 in the BUR) do not include an entry for emissions from international aviation bunker fuels. There are no estimates for emissions from marine bunker fuels because Bosnia and Herzegovina does not have any regulated seaports. The TTE notes that transparency would be further improved if such information on emissions from bunker fuels were to be reported as per the decision 17/CP.8 reporting template using the appropriate notation keys.

28. The GHG inventory reported in the BUR covers most of the categories and gases for which GHG emissions occur in Bosnia and Herzegovina and for which information was available; there is extensive use of the notation keys "NO" (not occurring) and, in particular, "NE". Bosnia and Herzegovina used the Non-Annex I Inventory software for calculation of the GHG inventory. However, in the BUR, Bosnia and Herzegovina did not provide transparent information on the methods and descriptions of the tiers used, as well as on the sources of activity data and emission factors and how they have been used in the estimation of emissions, in order to fully understand the GHG estimate calculations performed for specific source and sink categories. During the technical analysis, the TTE learned that the Revised 1996 IPCC Guidelines were used, but there are other references in the BUR to emission factors changing (e.g. for CH_4) without any further explanation. Transparency would be further improved if more information were to be provided on the methods, activity data and emission factors used, together with explanations on the use of the notation key "NE", for example, "lack of activity data" or "considered to be an insignificant source of emissions".

29. Bosnia and Herzegovina reports an analysis of key emissions sources for 2010 and 2011 in BUR tables 11 and 12, respectively. These key category tables provide further insights into the relative importance of the contributions of subcategories to the overall GHG inventory. The BUR notes that a major share of emissions comes from public

electricity and heat production (CO_2), followed by road transportation (CO_2), agricultural soils (N_2O) and solid waste disposal on land (CH_4).

30. In Bosnia and Herzegovina, the energy sector is the most significant sector in terms of GHG emissions, contributing 76.3 per cent and 77.7 per cent of the total emissions in 2010 and 2011, respectively. Two of the most carbon-intensive energy subsectors are energy conversion (thermal power plants and heating plants) and industrial fuel combustion, together contributing more than 80 per cent of the total CO_2 emissions from the energy sector. CO_2 emissions from transport are also highlighted in the energy sector, contributing 15 and 14 per cent, respectively, in 2010 and 2011.

31. A complete and consistent energy balance is the key instrument for preparation of the GHG inventory, particularly when emissions from the energy sector represent more than 70 per cent of the total emissions, which is the case in Bosnia and Herzegovina. However, the TTE learned that Bosnia and Herzegovina experiences challenges in collecting all reference approach parameters, particularly if internal imports and exports between the two entities[1] are taken into account.

32. The industrial processes sector contributed 6.67 per cent and 6.59 per cent of the total emissions in 2010 and 2011, respectively. Cement, iron and steel production are the most significant sources of CO_2 in the industrial processes sector. In 2010 and 2011, CO_2 emissions from industrial process were 56 per cent and 61 per cent, respectively, of the emissions from that sector in 1990. In 1990, emissions from industry contributed 10 per cent of the total N_2O emissions, but in 2010 and 2011, emissions of N_2O from this sector were almost negligible. Transparency could be improved if Bosnia and Herzegovina were to provide information on the reason for the reduction in N_2O emissions from the industrial processes sector.

33. The agriculture sector contributed 10.05 per cent and 9.12 per cent of the total emissions in 2010 and 2011, respectively. CH_4 emissions in the agriculture sector come from enteric fermentation and manure management, with a 2 per cent reduction in emissions between 2010 and 2011. With regard to N_2O emissions from the agriculture sector, the methodology used identifies three N_2O emissions sources: direct emissions from agricultural soils, emissions from domestic livestock and indirect emissions caused by agricultural activities. The largest sources of N_2O emissions are: from agricultural soils including the application of artificial fertilizers; nitrogen from animal manure, legume and soy farming; nitrogen from crop residues; and peat-bog cultivation.

34. Changes in forest and other woody biomass stocks are reported for 2010 and 2011 as net removals of −6,476 Gg CO_2 eq and −6,174 Gg CO_2 eq, respectively. According to the data collected, the forests in Bosnia and Herzegovina represent a significant CO_2 sink, although a downward trend has been observed in recent years. Limited data availability contributed to uncertainty in some of the categories.

35. Bosnia and Herzegovina reports data only for changes in forest and other woody biomass stocks. During the technical analysis, the TTE learned that calculations of emissions and removals for other land categories are not included due to a lack of accessible activity data that are consistent and complete. For example, there are insufficient accurate data on forest loss due to fire, and changes in forest and grassland, abandonment of managed land and soil carbon are not reported due to a lack of accessible activity data.

36. The waste sector contributed 6.99 per cent and 6.62 per cent of the total emissions in 2010 and 2011, respectively. Emissions are reported for solid waste disposal on land and for wastewater handling. CH_4 emissions from landfills have seen an increase of 90 per cent

[1] The two entities are the Federation of Bosnia and Herzegovina and the Republic of Srpska, as well as Brčko District.

from the base year of 1990. This is described as being in part due to increased waste generation, as well as a change to the IPCC emission factors, but the BUR does not provide information on exactly what these changes were. The TTE notes that transparency could be improved by providing this information.

3. Mitigation actions and their effects, including associated methodologies and assumptions

37. As indicated in table 2 above, Bosnia and Herzegovina reported, in its BUR, information on mitigation actions and their effects.

38. Bosnia and Herzegovina reported, in its first BUR, mitigation actions covering the energy, transport, waste, forestry and agriculture sectors.

39. The BUR provides information consistent with decision 2/CP.17, paragraphs 11 and 12, on mitigation actions in tabular format. Bosnia and Herzegovina has reported 25 mitigation actions covering the period until 2040. Ten parameters have been detailed for each action, including: name of the activity, sector, status, objective, description of the mitigation action, gas, time frame, coordination and management arrangement, estimated emission reduction, co-benefits, support received and costs involved. These actions are either ongoing or planned. For instance, the energy production sector has seven ongoing actions and six planned actions, and the transport sector has three ongoing actions and one planned action. The cumulative GHG mitigation of all these actions is 8,492 Gg CO_2 eq based on the information contained in table 3.11 of the BUR.

40. Bosnia and Herzegovina has projected its future emissions until 2040, using a modelling framework. This is presented separately for each sector and also cumulatively. Projections are conducted under three development scenarios: the 'business as usual' scenario (S1), which is the baseline scenario; partial implementation of mitigation actions scenario (S2); and the advanced scenario (S3), which assumes the implementation of a comprehensive set of mitigation actions.

41. The TTE noted that Bosnia and Herzegovina has provided detailed information in its second national communication and its BUR on sectoral assumptions for emission projections. However, the transparency of reporting could be enhanced by providing additional information on the methodology used to undertake the modelling.

42. Description of the mitigation actions is included in the BUR, but transparency could be enhanced by providing information on methodologies, progress indicator and steps taken or envisaged to achieve the mitigation action.

43. The main objectives of the mitigation actions presented by Bosnia and Herzegovina are transparently indicated in the BUR and are mainly within the context of co-benefits and GHG emission reductions. For instance, 7 out of 25 projects indicate GHG emission reductions as the main objective, while the others indicate co-benefits, such as reduction in energy demand, system efficiency enhancement, energy cost reduction, reducing losses in forest cover and trees, and afforestation as the main objective.

44. Bosnia and Herzegovina is a net exporter of electricity. The use of local coal contributes to two thirds of the total power generation, which is set to continue as the main power source; therefore, GHG emissions from power generation are projected to increase in the future. Under the S1 scenario, although electricity generated from renewable energy sources is projected to increase by 21 per cent during 2015–2040, the overall GHG emissions is projected to increase by 31 per cent. Under the S2 scenario, GHG emissions are projected to increase by 120 per cent during the same period. Under the S3 scenario, when a higher utilization of renewable energy sources and a higher energy efficiency are targeted, the GHG emissions are projected to almost equal the 2010 levels in 2040. Bosnia

and Herzegovina also tabulated, but not quantified, the co-benefits from mitigation actions such as reduced mortality, morbidity, ageing of building materials, noise levels and acidification, as well as enhanced crop yields.

45. Bosnia and Herzegovina has two laws, on renewable energy sources and efficient cogeneration. It has also estimated the detailed potentials of these sources (biogas, solar energy and geothermal energy). However, Bosnia and Herzegovina indicated that in the absence of an incentive scheme, the utilization of renewable energy projects on the ground will be delayed. It has projected a GHG mitigation potential of up to 120 Gg CO_2 during the period 2010–2040.

46. Bosnia and Herzegovina has indicated that 12 per cent of households are covered by district heating systems that are more than 25 years old, with energy losses as high as 60 per cent, and which do not have full cost recovery. There is a possibility to mitigate 153 Gg CO_2 by 2040 under the advanced scenario (S3). This would also result in EUR 50 billion net benefits that could be used to finance the initiatives planned for enhancing building energy efficiency under the S3 scenario. For the remaining 88 per cent of households that are not presently covered by district heating, Bosnia and Herzegovina has projected that although additional households would be brought into formal district heating systems and also move away from biomass to conventional fossil fuel based heating, the GHG emissions are not projected to increase much during the period 2010–2040, due to enhanced energy efficiency measures. Cumulative savings of EUR 3.323 billion could occur due to these measures, which may encourage the implementation of these measures.

47. For the transport sector, which is dominated by road transport, there are no significant programmes or projects focusing on reducing GHG emissions. However, Bosnia and Herzegovina projected a potential to reduce GHG emissions by 37 per cent in 2040 as compared to 2010, resulting in a cumulative saving of EUR 1.4 billion during the period 2010–2040. Similarly, the GHG emissions from the agriculture sector could reduce by 48 per cent in 2040 as compared to 2010, resulting in a benefit of EUR 1.08 billion during the period 2010–2040. For the forestry sector, the additional sink capacity will be around 300 Gg CO_2 during the period 2010–2040, with cumulative benefits of EUR 108 million. Emissions from the waste sector are projected to increase due to enhanced activities until 2025 and then decline by about 700 Gg CO_2 eq in 2040 below 2010 levels, mainly due to higher levels of recycling, reuse and biological treatment and incineration of waste.

48. Information on international market mechanisms was not provided in the BUR; however, Bosnia and Herzegovina provided further clarification during the consultation with the TTE that they indeed have some clean development mechanism projects.

49. Overall, Bosnia and Herzegovina has indicated that GHG emissions are expected to increase by approximately 65 per cent during the period 2010–2040, within the S1 scenario. However, due to advanced mitigation actions, they may be reduced by 17 per cent during the period 2010–2040, within the context of the S3 scenario.

4. Constraints and gaps, and related financial, technical and capacity-building needs, including a description of support needed and received

50. In accordance with decision 2/CP.17, annex III, paragraph 14, Bosnia and Herzegovina reported, in its BUR, on constraints and gaps, and related financial, technical and capacity-building needs. Bosnia and Herzegovina noted that the information provided in its second national communication regarding constraints and gaps related to institutional, legal, financial, technical and human capacity remains relevant for the BUR. Further, since the second national communication, progress has only been observed in the area of capacity-building for individuals and institutions, whose experts have been trained and gained experience, through their involvement in the preparation of the inventory.

51. Information was also reported on key constraints and gaps and related needs regarding the preparation of the GHG inventory. In particular, Bosnia and Herzegovina noted that there is currently no environmental database or monitoring system in place that would form the basis for the preparation of the GHG inventory. In addition, there is no clear model of information flow between different sectors, there are no fully defined competences and responsibilities between the institutions involved and there is no methodology on how data should be delivered. To address these gaps, Bosnia and Herzegovina identified the need for a clearly defined system for data collection and processing, procedures for quality assurance and control of input data, and a system for reporting and monitoring. The need for increased and sustained funding for the collection of basic data and GHG emission data, as well as the training of experts involved in emission measurement and reporting in key sectors, has also been highlighted.

52. In section 4 of the BUR, some constraints and needs for establishing a comprehensive domestic MRV system are highlighted. In particular, while there are currently institutions with legally defined competences that could report on the implementation of mitigation actions, there is a need to build and strengthen the capacity of these institutions to ensure that they can measure, report and verify data and information according to international standards. The TTE also noted that the transparency of information reported could be enhanced by establishing a system or network to exchange information and data, with clear standards to process and prepare the information.

53. In accordance with decision 2/CP.17, annex III, paragraph 15, information was reported, in a tabular format (table 3.11), on support received for the preparation and implementation of mitigation actions. The TTE noted that support was provided by various international organizations (United Nations Development Programme (UNDP) and World Bank), bilateral development agencies (United States of America Agency for International Development, Swedish International Development Cooperation Agency, German Society for International Cooperation and Czech Development Agency) and non-governmental organizations. In the table, information is also provided on the type of support received (i.e. capacity-building, technical or financial) and the type of financial support (i.e. loans, grants, funds, etc.), when applicable. However, the table only provides the preparation and implementation costs of mitigation activities, and does not specify the exact financial support received. The transparency could be enhanced by including this information in the table.

54. Information was also reported on support received from UNDP for the preparation of the BUR, and additional details were provided during the technical analysis on the nature of the support, including financial, technical and capacity-building support. Bosnia and Herzegovina also clarified that it received financial support from the Global Environmental Facility to prepare its BUR.

55. With regard to technology development and transfer, the BUR did not contain information on Bosnia and Herzegovina's technological needs, but the TTE was informed, during the technical analysis, that a technology needs assessment was undertaken, in the context of the upcoming third national communication. Information was also reported on technology support received, in table 3.11 of the BUR, by highlighting technology transfer and technical support provided for the preparation and implementation of mitigation actions.

5. Domestic measurement, reporting and verification

56. In accordance with decision 2/CP.17, annex III, paragraph 13, Parties should provide information on the description of domestic MRV arrangements. Bosnia and Herzegovina indicated that it aims to develop its MRV arrangements for nationally appropriate mitigation actions (NAMAs) by expanding the mandate of its clean development

mechanism designated national authority, giving it legal and institutional power. The TTE noted that the information on domestic MRV arrangements for NAMAs is structured under the elements contained within the annex to decision 21/CP.19. However, most of the information provided is a description of the plans for the establishment of an institutional framework for the MRV system of NAMAs.

57. Bosnia and Herzegovina has institutions with legally defined competences that could report on the implementation of mitigation actions. There is currently a practice to monitor energy consumption by companies/organizations and enhance the reliability and timeliness of data processing. In order to ensure that the institutions measure, report and verify data in accordance with international standards, Bosnia and Herzegovina has indicated that it will build and strengthen the capacity of these existing institutions.

D. Identification of capacity-building needs

58. In consultation with Bosnia and Herzegovina, the TTE identified the following capacity-building needs related to the facilitation of the preparation of subsequent BURs and participation in ICA:

(a) Establishing clearly defined institutional arrangements including for data collection and processing, quality assurance and control of input data using appropriate available tools (e.g. the template workbook "Developing a National GHG Inventory System",[2] which is already being used by a number of developing countries to facilitate reporting in the BUR on a continuous basis). The TTE noted that this has been identified in section 1.6.2 of the BUR where constraints and gaps are outlined;

(b) Identifying and filling data gaps in the GHG inventory, for example, relating to emissions of HFCs, PFCs and SF6, and reporting the tables included in annex 3A.2 to chapter 3 of the IPCC good practice guidance for LULUCF, and the sectoral report tables annexed to the Revised 1996 IPCC Guidelines;

(c) Establishing and reporting a consistent time series back to the reported years in the second national communication;

(d) Estimating and reporting emissions from international aviation bunker fuels;

(e) Describing the approach taken, including the methodologies and underlying assumptions, for the uncertainty assessment of the national GHG inventories;

(f) Better defining, through considering legal regulations, competences and responsibilities for preparing the GHG inventory and legislative requirements on the type and scope of data to be collected;

(g) Improving compatibility between existing data and those required under the IPCC methodologies, and difficulties in ensuring data quality;

(h) Enhancing capacity of institutions and experts involved in data collection, measurement and management, calculating emissions and emission factors, and research and projections of national GHG emissions;

(i) Improving vertical and horizontal cooperation and coordination among competent institutions as well as information flow between responsible agencies and across sectors;

(j) Improving integration of climate change considerations in sectoral policies and strategies;

[2] <http://www.epa.gov/climatechange/Downloads/EPAactivities/Complete-Template-Workbook.doc>.

(k) Improving awareness of institutions responsible for establishment of the GHG inventory with regard to Bosnia and Herzegovina's commitments under the Convention and the Kyoto Protocol;

(l) Reporting information on the progress of implementation of the mitigation actions and the underlying steps taken or envisaged and the results achieved;

(m) Improving the capacity-building for some cross-cutting issues, including adaptation, by the following actions:

(i) Monitoring climate change impacts;

(ii) Developing the knowledge associated with the modernization of the network of meteorological stations (use automatic weather stations and link them with hydrological stations in automatic monitoring systems);

(iii) Raising private sector and public awareness of problems associated with climate protection and potential impacts of climate change;

(iv) Developing the weak institutional capacity to implement effective and forceful policies, such as economic instruments, that can change the behaviour of people and institutions towards environmental protection;

(n) Integrating sectoral policies and strategies into climate change considerations in the agriculture sector;

(o) Filling data gaps in the waste sector;

(p) Undertaking long-term research and monitoring in the forestry sector to understand the potential of forests in mitigating climate change;

(q) Addressing the lack of effective information networks, as well as standards for the processing and preparation of information to be fed into the network, as the biggest problem in implementing NAMA programmes. Accordingly, Bosnia and Herzegovina identified the establishment of a system of information exchange of data as a key need;

(r) Establishing an information network between NAMA projects and relevant ministries, in order to increase the flow of information on NAMA activities;

(s) Establishing fully functional MRV arrangements.

III. Conclusions

59. The TTE concludes that:

(a) All of the elements of information listed in paragraph 3(a) of the ICA guidelines are included in the first BUR of Bosnia and Herzegovina;

(b) Bosnia and Herzegovina has reported on its national circumstances that may affect its ability to deal with climate change mitigation and adaptation, such as its geography, population, climate, and political and economic profiles. The TTE also acknowledges the efforts made by Bosnia and Herzegovina to enhance its capacity to prepare national communications and BURs and notes a need to further enhance the institutional arrangements and capacity in order to ensure the preparation of these reports on a regular basis;

(c) A summary of GHG inventory data is provided for 2010 and 2011. The GHG inventory reported covers most of the categories and gases for which GHG emissions and removals occur in Bosnia and Herzegovina and for which information was available, noting extensive use of the notation keys "NO" and, in particular, "NE". The energy sector is the

most significant sector in terms of GHG emissions, contributing 76.3 per cent and 77.7 per cent of the total emissions in 2010 and 2011, respectively. Key category tables provide further insights into the relative importance of the contributions of subcategories to the overall GHG inventory. The major share of emissions comes from public electricity and heat production (CO_2), followed by road transportation (CO_2), agricultural soils (N_2O) and solid waste disposal on land (CH_4). The TTE acknowledges the challenges and constraints faced by Bosnia and Herzegovina in preparing its GHG inventory and notes that transparency could be improved by providing more detailed and background information to support the data reported;

(d) The BUR provides information consistent with decision 2/CP.17, paragraphs 11 and 12, on mitigation actions in a tabular format. Bosnia and Herzegovina has reported 25 mitigation actions covering the period until 2040 resulting in a cumulative GHG mitigation of 8.492 Gg CO_2 eq based on the information contained in table 3.11 of the BUR. Bosnia and Herzegovina has also projected its future emissions until 2040 using a modelling framework. This is presented separately for each sector and also cumulatively, under three scenarios, namely the 'business as usual' scenario (S1), which is the baseline scenario, the partial implementation of mitigation actions scenario (S2) and the advanced scenario (S3), which assumes the implementation of a comprehensive set of mitigation actions. Overall, Bosnia and Herzegovina has indicated that GHG emissions are expected to increase by approximately 65 per cent during the period 2010–2040, within the S1 scenario. However, due to advanced mitigation actions under the S3 scenario, they may be reduced by 17 per cent during the same period;

(e) Constraints and gaps, and related needs regarding the preparation of the GHG inventory and the development of an MRV system, are reported in the BUR. The TTE identifies information and data collection and management as one of the main challenges to enhance the quality of GHG inventories and provide better transparency when reporting on mitigation actions. It was also noted that information provided in Bosnia and Herzegovina's second national communication regarding constraints and gaps related to institutional, legal, financial, technical and human capacity remains relevant for the BUR. Information was provided on support received from the UNDP for the preparation of the BUR as well as support received from various organizations and bilateral agencies for the preparation and implementation of mitigation actions.

60. The TTE, in consultation with Bosnia and Herzegovina, identified 19 capacity-building needs related to the facilitation of reporting in accordance with annex III to decision 2/CP.17 and to the participation in ICA in accordance with annex IV to decision 2/CP.17, taking into account Article 4, paragraph 3, of the Convention, which are summarized in section II.D above. The key capacity-building needs prioritized by Bosnia and Herzegovina are summarized as follows:

(a) Building capacity of institutions and experts involved in data collection, measurement and management, calculating emissions and emission factors, and research and projections of national GHG emissions;

(b) Developing vertical and horizontal cooperation and coordination among competent institutions as well as information flow between responsible agencies and across sectors;

(c) Integrating of climate change considerations in sectoral policies and strategies;

(d) Raising private sector and public awareness regarding problems associated with climate protection and potential impacts of climate change;

(e) Developing the weak institutional capacity to implement effective and forceful policies, such as economic instruments, that can change the behaviour of people and institutions towards environmental protection;

(f) Reporting information on the progress of implementation of the mitigation actions and the underlying steps taken or envisaged and the results achieved;

(g) Addressing the lack of effective information networks, as well as standards for the processing and preparation of information to be fed into the network, as the biggest problem in implementing NAMA programmes;

(h) Establishing an information network between NAMA projects and relevant ministries, in order to increase the flow of information on NAMA activities.

Annex

Documents and information used during the technical analysis

Reference documents

"Composition, modalities and procedures of the team of technical experts for undertaking the technical analysis of biennial update reports from Parties not included in Annex I to the Convention". Annex to decision 20/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=12>.

"Modalities and guidelines for international consultation and analysis". Annex IV to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

"UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention". Annex III to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

"Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention". Annex to decision 17/CP.8. Available at <http://unfccc.int/resource/docs/cop8/07a02.pdf#page=2>.

First biennial update report of Bosnia and Herzegovina. Available at <http://unfccc.int/8722.php>.

Second national communication of Bosnia and Herzegovina Available at <http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php>.